



Application Note 8

Ultra-high speed imaging of a blast initiator

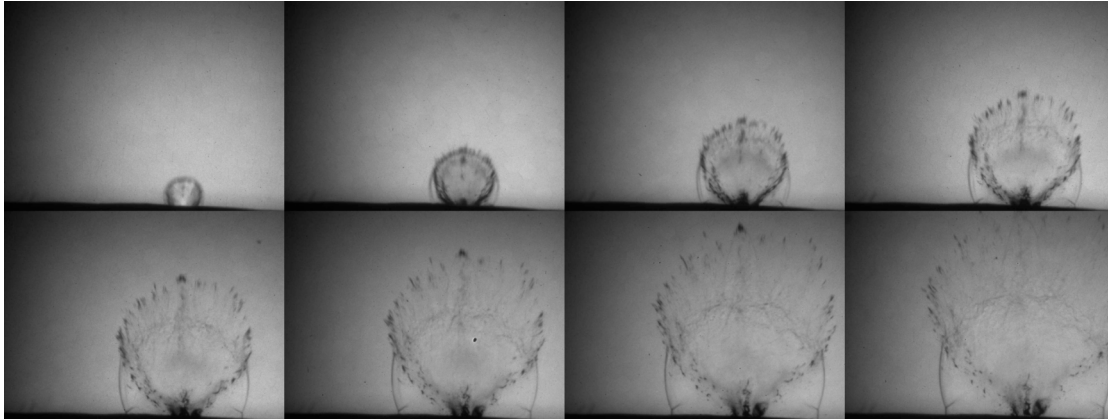


Image courtesy e2V Technologies Ltd. Lincoln

IMAGING PARAMETERS

200mm lens with 120mm extension tube giving approx 10mm field of view.

Experiment back-lit with IF300 used as point source (no reflector) with 200mm simple lens at 2f (400mm) from flash.

Image taken with 50ns exposures, 250ns separation to show full development of event

EQUIPMENT PARAMETERS

The SIM8 was programmed to take an 8 frame sequence with initial delay of 20us. This allowed plenty of time for the flash to come up to full brightness. The Monitor pulse output was programmed to trigger the event. The IF300 flash was triggered 8us prior to frame 1 to ensure full brightness at the time of recording.

OVERVIEW OF EXPERIMENT

The initiator produces a bright flash which obscures the ejection of the disc and fragments. The IF300 (300J, 25us) flash is used to see through the self luminosity of the event.

The IF300, which is a spark source, is placed behind the event, with a 200mm simple lens positioned 400mm from the flash source and just behind the event, thereby creating a pseudo schlieren system.

The shock waves caused by the breakdown are clearly seen as are the ejected fragments. The slapper plate itself can be clearly seen in the later exposures being ejected vertically.

The shockwave from the slapper plate has a very narrow mach angle which may be used to estimate its velocity.